

represent a hydrogen atom, a halogen atom, an aliphatic hydrocarbon group having from 1 to 30 carbon atoms, an aromatic hydrocarbon group having from 6 to 30 carbon atoms, an alkoxy group having from 1 to 30 carbon atoms, an aryloxy group having from 6 to 30 carbon atoms, a thioalkoxy group having from 1 to 30 carbon atoms, a thioaryloxy group having from 6 to 30 carbon atoms, an amino group, an amido group, or a carboxyl group, and R<sup>1</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> may be the same or different, and R<sup>1</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> may be optionally bonded to each other to form a cyclic structure; Z represents a metal element of Groups 2 to 13; m is an integer, indicating the valency of the metal element Z; and R<sup>2</sup> represents a hydrocarbon group.)

7. (Amended) The catalyst as claimed in claim 1 for copolymerization of olefins and styrenes, wherein at least one of three R<sup>1</sup>'s is an aromatic hydrocarbon group having from 6 to 30 carbon atoms.

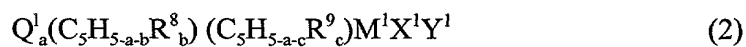
8. (Amended) The catalyst as claimed in claim 1 for copolymerization of olefins and styrenes wherein three R<sup>1</sup>'s are all aromatic hydrocarbon groups each, having from 6 to 30 carbon atoms.

9. (Amended) The catalyst as claimed in claim 1 for copolymerization of olefins and styrenes, wherein three R<sup>1</sup>'s are all phenyl groups.

10. (Amended) The catalyst as claimed in claim 1 for copolymerization of olefins and styrenes, wherein R<sup>2</sup> is an alkyl group having at least 2 carbon atoms.

11. (Amended) The catalyst as claimed in claim 4 for copolymerization of olefins and styrenes, wherein Z is aluminium.

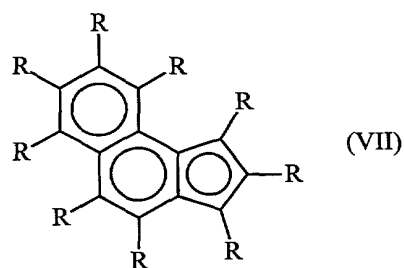
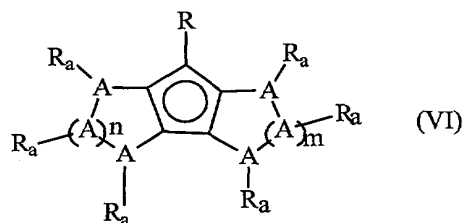
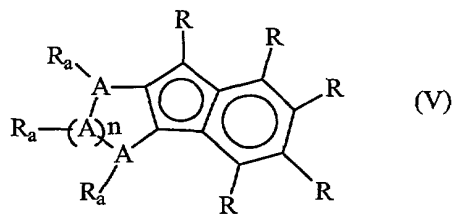
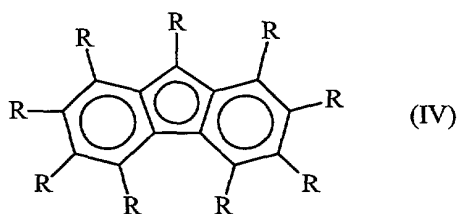
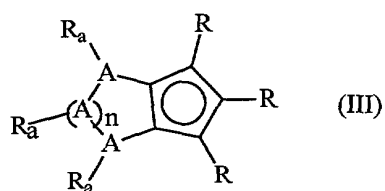
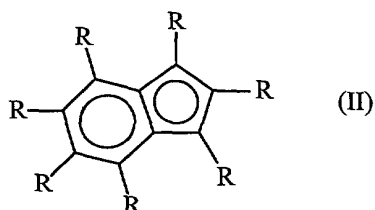
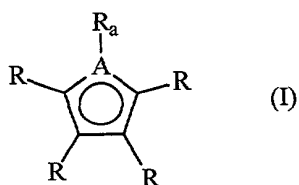
12. (Amended) The catalyst as claimed in claim 1 for copolymerization of olefins and styrenes, wherein the transition metal compound (A) is represented by any of the following general formulae (2) to (6):





in which  $Q^1$  represents a bonding group that crosslinks the two conjugated five-membered cyclic ligands ( $C_5H_{5-a-b}R^8_b$ ) and ( $C_5H_{5-a-c}R^9_c$ );  $Q^2$  represents a bonding group that crosslinks the conjugated five-membered cyclic ligand ( $C_5H_{5-a-d}R^{10}_d$ ) and the group  $Z^1$ ;  $R^8$ ,  $R^9$ ,  $R^{10}$  and  $R^{11}$  each represent a hydrocarbon group, a halogen atom, an alkoxy group, a silicon-containing hydrocarbon group, a phosphorus-containing hydrocarbon group, a nitrogen-containing hydrocarbon group, or a boron-containing hydrocarbon group; and a plurality of these groups, if any, may be the same or different, and may be bonded to each other to form a cyclic structure; a represents 0, 1 or 2; b, c and d each represent an integer of from 0 to 5 when a = 0, or an integer of from 0 to 4 when a = 1, or an integer of from 0 to 3 when a = 2; e is an integer of from 0 to 5;  $M^1$  represents a transition metal of Groups 4 to 6 of the Periodic Table;  $M^2$  represents a transition metal of Groups 8 to 10 of the Periodic Table;  $L^1$  and  $L^2$  each represent a coordination-bonding ligand;  $X^1$ ,  $Y^1$ ,  $Z^1$ ,  $W^1$  and  $U^1$  each represent a covalent-bonding or ionic-bonding ligand; and  $L^1$ ,  $L^2$ ,  $X^1$ ,  $Y^1$ ,  $Z^1$ ,  $W^1$  and  $U^1$  may be bonded to each other to form a cyclic structure.

13. (Amended) The catalyst as claimed in claim 1 for copolymerization of olefins and styrenes, wherein, in the transition metal compound (A) of formula (4), the group ( $C_5H_{5-e}R^{11}_e$ ) is represented by any of the following general formulae (I) to (VII):



wherein A represents an element of Group 13, 14, 15 or 16, and plural A's may be the same or different; R represents a hydrogen atom, a halogen atom, an aliphatic hydrocarbon group having from 1 to 30 carbon atoms, an aromatic hydrocarbon group having from 6 to 30 carbon atoms, an alkoxy group having from 1 to 30 carbon atoms, an aryloxy group having from 6 to 30 carbon atoms, a thioalkoxy group having from 1 to 30 carbon atoms, a thioaryloxy group having from 6 to 30 carbon atoms, an amino group, an amido group, a